Using technology-enhanced peer tutoring to support knowledge sharing in Learning Networks

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Methodological focus. Theme 1: Researching next generation technology enhanced learning.

Method used in technology-enhanced peer tutoring.

In Learning Networks (LNs), learners need to acquire knowledge through knowledge sharing with other participants. However, without support, learners have to self-organize knowledge sharing by finding a relevant knowledge sharer, structuring the interaction and maintaining the communication process. According to cognitive load theory (CLT), these activities could induce extraneous load because they are not directly relevant to learning itself but to the learning environment. When working on complex tasks, extraneous load becomes detrimental to learning effectiveness and efficiency because learners have to simultaneously deal with the high intrinsic load of the complex tasks and the extraneous load of knowledge sharing activities. For such tasks, it is considered imperative to reduce extraneous load.

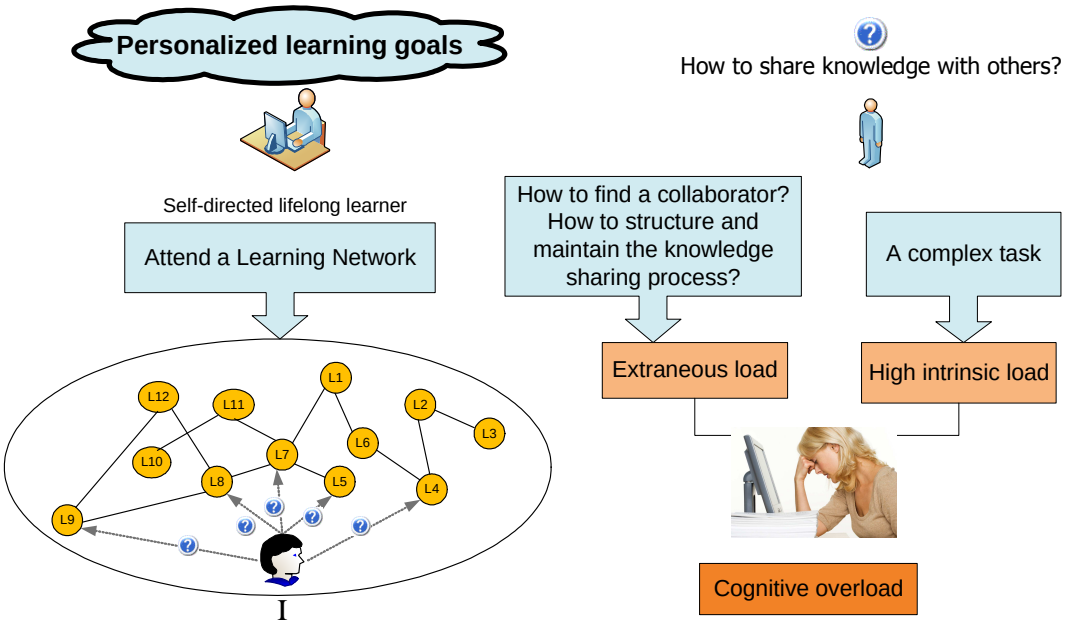

Figure 1. Self-organized knowledge sharing and cognitive load

We proposed a technology-enhanced peer tutoring (PT) system developed by Van Rosmalen et al. (2008a; 2008b) to support knowledge sharing. In this study, we reused this system (i.e. originally designed for alleviating tutor load) to reduce learners' extraneous load. When knowledge sharing was inquired by learners (tutees), this system automatically assigned suitable peer tutors based on a set of selection criteria such as availability, content competency, tutor competency and eligibility (Van Rosmalen et al., 2008a; Van Rosmalen et al., 2008b). Additionally, this PT system included role specifications that specified what tutors and tutees should do as well as an editable website of *wiki* that allowed learners to work collaboratively. The main purpose of this study is to investigate whether such a PT system can support knowledge sharing by reducing extraneous load as argued, especially when working on complex tasks. To assess the cognitive effect of this PT system, we measured cognitive load by asking learners to report how much mental effort they invested during the learning process. According to CLT, we calculated *learning efficiency* by combining the mental effort with the test performance to know whether this PT system is effective in reducing extraneous load.

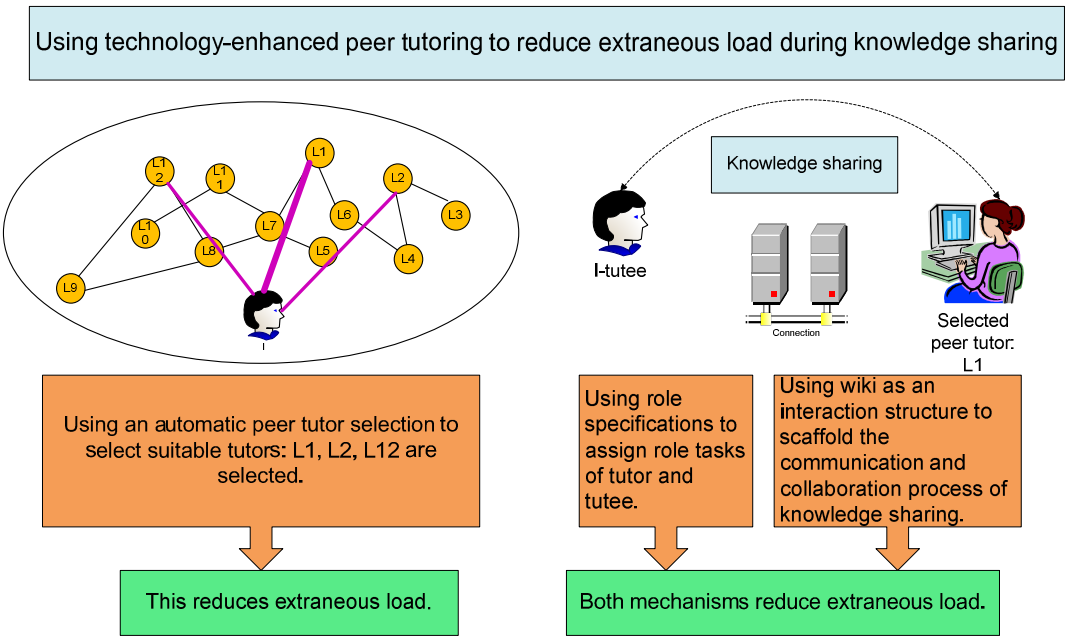

Figure 2. Technology-enhanced peer tutoring and knowledge sharing

Considerations for next generation methodological innovations.

We considered the limitation of human cognitive capacity by applying CLT and modernize the traditional PT method to accommodate the non-formal learning environments. We suggest that future research on technology-enhanced learning not only assesses effects of a new technology on supporting knowledge sharing but also analyses how such a technology influences human cognitive system on dealing with knowledge sharing.

References

Van Rosmalen, P., Sloep, P., Brouns, F., Kester, L., Berlanga, A., Bitter, M., et al. (2008a). A model for online learner support based on selecting appropriate peer tutors. *Journal of Computer Assisted Learning, 24*(6), 483-493.

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